

### **REMARKS**

Claims 1-18 are now pending in the application. The specification has been amended in compliance with 37 C.F.R. §1.17(g), 35 U.S.C. §103(c)(2)(C), and MPEP §§706.02(l)(1)(II) and 706.02(l)(2) to include a new paragraph disclosing a "Joint Research Agreement" that provides the names of each party to a joint research agreement pertaining to the present application and claimed invention. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

### **SPECIFICATION**

As noted above, the specification has been amended to include a new section pertaining to a written joint research agreement between (1) Arteva Specialties S.á.r.l. (now INVISTA S.á.r.l.); Arteva North America S.á.r.l. (now INVISTA North America S.á.r.l.), Arteva Technologies S.á.r.l. (now INVISTA Technologies S.á.r.l.), KoSa GmbH & Co. KG (now INVISTA Resins Fibers GmbH & Co. KG) and (2) Amcor PET Packaging (a wholly-owned subsidiary of Amcor Limited), in compliance with 37 C.F.R. §1.17(g), 35 U.S.C. §103(c)(2)(C), and MPEP §§706.02(l)(1)(II) and §706.02(l)(2).

#### **STATEMENT OF JOINT RESEARCH AGREEMENT**

In compliance with 37 C.F.R. §1.104(c)(4) and 35 U.S.C. §103(c), the claimed invention was made by or on the behalf of Amcor PET Packaging (a wholly owned subsidiary of Amcor, Limited). Amcor PET Packaging and Arteva Specialties S.á.r.l. (now INVISTA S.á.r.l.); Arteva North America S.á.r.l. (now INVISTA North America S.á.r.l.), Arteva Technologies S.á.r.l. (now INVISTA Technologies S.á.r.l.), KoSa GmbH & Co. KG (now INVISTA Resins Fibers GmbH & Co. KG) were parties to a joint research agreement within the meaning of 35 U.S.C. §103(c)(3), which was in effect on or before the date the claimed invention was made. The claimed invention was made as a result of activities undertaken within the scope of the joint research agreement. Thus, the inventive activities fall under the scope of 35 U.S.C. §103(c)(2)-(3) and the present application can be terminally disclaimed over U.S. Patent No. 7,473,755 pursuant to 37 C.F.R. §1.321(d).

### **REJECTIONS UNDER 35 U.S.C. § 103**

Claims 1-3, 5, 7-8, 10, 12-13 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fagerburg et al. (U.S. Pat. No. 4,499,252) (hereafter "*Fagerburg*") in view of Banach et al. (U.S. Pat. No. 5,902,873) (hereafter "*Banach*") and optionally Shelby et al. (U.S. Pub. No. 2002/0166833) (hereafter "*Shelby*") and Sprayberry et al. (WO 98/48994) (hereafter "*Sprayberry*"). This rejection is respectfully traversed.

Claims 4 and 15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Fagerburg* in view of *Banach*, *Shelby*, and *Sprayberry*, and further in view of Abe et al. (Japanese Pat. No. 03146710) (hereafter "*Abe*"). This rejection is respectfully traversed.

Claim 6 stands rejected under 35 U.S.C. 103(a) as being unpatentable over *Fagerburg* in view of *Banach*, *Shelby*, and *Sprayberry*, and further in view of Amano et al. (U.S. Pat. No. 6,096,683) (hereafter "*Amano*"). This rejection is respectfully traversed.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Fagerburg* in view of *Banach*, *Shelby*, and *Sprayberry*, and further in view of Schmidt et al. (U.S. Pub. No. 2002/0177686) (hereafter "*Schmidt*"). This rejection is respectfully traversed.

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Fagerburg* in view of *Banach*, *Shelby*, and *Sprayberry*, and further in view of Po' et al. (U.S. Pat. No. 5,252,282) (hereafter "*Po*"). This rejection is respectfully traversed.

Claim 10 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Fagerburg* in view of *Banach*, *Shelby*, and *Sprayberry*, and further in view of PET Packaging Technology (hereafter "*PPT*"). This rejection is respectfully traversed.

Claims 11 and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Fagerburg* in view of *Banach*, *Shelby*, and *Sprayberry*, and further in view of *Feddersen et al.* (U.S. Pat. No. 5,047,271) (hereafter "*Feddersen*"). This rejection is respectfully traversed.

Claims 13 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Fagerburg* in view of *Banach*, *Shelby*, and *Sprayberry*, and further in view of the *PPT* reference. This rejection is respectfully traversed.

Claim 18 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Fagerburg* in view of *Banach*, *Shelby*, *Fagerburg* and *Sprayberry*. This rejection is respectfully traversed.

Applicants' respectfully request the Examiner's reconsideration of the obviousness rejection, because nothing in the scope and content of the cited art teaches or otherwise provides a skilled artisan with any reasonable expectation of success to arrive at the claimed invention, which addresses specific technical issues in sulfonomer modified polyester resin systems. The claimed invention is directed to a parison or rigid container comprising a polyester resin, modified by inclusion of 0.01 mol. % to 5 mol. % of a di-functional sulfonomer modifier of formula 1, as commonly recited in independent claims 1, 17, and 18. However, such PET systems (modified by inclusion of such sulfonomers) can form especially high amounts of diethylene glycol (DEG) byproduct during the PET formation reactions. This DEG byproduct becomes

incorporated into a PET polymer leading to high natural stretch ratios (NSR). DEG can also be intentionally added as a glycol reactant for PET resins to shift the onset of strain hardening to higher stretch values (to increase NSR) and to prevent crystallization. See e.g., Applicants' Specification at pages 3-4. However, the intentional addition of DEG reactant or the formation of DEG as a byproduct can be problematic. For PET resins that are formed into small bottles in particular, while a slow crystallization rate is desirable, the presence of DEG poses significant issues when forming small containers, because NSR is too high. See for example, pages 2-4 of Applicants' Specification and Claims 16 and 18. For such applications, the claimed materials form a parison or rigid container where diethylene glycol (DEG) byproduct formation is suppressed, despite the presence of the sulfomonomer of formula I. Moreover, the claimed materials desirably achieve an NSR or less than 10, which is particularly suitable for blowing small containers.

*Fagerburg* fails to appreciate any issue with excessive formation of DEG byproduct during reactions with sulfomodified PET resins and therefore fails to teach any means to suppress the excessive formation of DEG. *Fagerburg's* polyester resins do not have an intrinsic viscosity of 0.6 to 1.0 and a natural stretch ratio (NSR) of less than 10, as claimed. Instead, *Fagerburg* discusses intentionally adding DEG as a glycol reactant at col. 3, lines 35-44. U.S. Patent No. 4,579,936 to *O'Neill* (which was commonly owned by the same owner as the cited *Fagerburg* reference) outlines the shortcomings of sulfomonomer modified PET resins in *Fagerburg*. See also, page 4 of Applicants' specification. Specifically, *O'Neill* states that "[e]thylene terephthalate copolymers modified with dimethyl 5-sodiosulfoisophthalate or 5-sodiosulfoisophthalic

acid are described in ... U.S. Pat. No. 4,499,262 by Fagerburg ... **When the aromatic modifiers are used, however, a buffer such as sodium acetate must be used to limit the formation of uncontrolled amounts of diethylene glycol as a by-product.**

The presence of sodium acetate (NaOAc) significantly reduces the polymerization rate and serves to offset the economic advantage of using these aromatic modifiers." Emphasis added. *O'Neill* at col. 1, lines 12-28. Therefore, *O'Neill* underscores that *Fagerburg's* PET systems are specialized systems, because of the presence of dimethyl 5-sodiosulfoisophthalate or 5-sodiosulfoisophthalic acid, and therefore experience unique issues with significant formation of undesirable DEG byproduct by side reactions during PET formation. As discussed above, one particular issue addressed by the claimed invention is to minimize the formation and presence of DEG byproduct that undesirably increases NSR.

No conventional PET system, whether modified by a sulfomonomer or not, suppresses DEG formation during formation by using  $\text{Na}_2\text{HPO}_4$  as a stabilizer. Likewise, no conventional PET system, excluded  $\text{NaH}_2\text{PO}_4$  to suppress DEG formation. Accordingly, the selection of  $\text{Na}_2\text{HPO}_4$  as a stabilizer to suppress DEG formation in sulfomonomer modified PET resins, while avoiding  $\text{NaH}_2\text{PO}_4$ , is not obvious in view of the scope and content of the prior art. The obviousness of selection of components for a product, particularly when there is no prediction in the prior art as to the results obtainable from a selected component, is a different analysis than the obviousness inquiry in *KSR* (where the inquiry investigates whether an improvement is more than the predictable use of prior art elements according to their established functions). See *Abbott Labs. v. Sandoz, Inc.*, 89 USPQ.2d 1161, 1170-71 (Fed. Cir. 2008) citing *KSR v.*

*Teleflex*, 127 S. Ct. 1727, 1740 (2007). Thus, it is not obvious to select a component or a compound where it provides unexpected results that could not be predicted from the scope and content of the art.

The cited *Banach* reference discloses many different phosphate compounds for use in a catalyst system. But, in viewing the *Banach* reference, a person of ordinary skill in the art could not predict that one of these phosphate compounds could suppress DEG byproduct formation to such an extent during copolymerization of the modified sulfonomers that the NSR of the resulting polyester would be advantageously lowered to below 10. Furthermore, that same skilled artisan would find no apparent reason to avoid another of these many phosphate compounds in *Banach* in making the claimed sulfonomer modified polyester polymer, particularly when the compound to be avoided ( $\text{NaH}_2\text{PO}_4$ ) is stated to be preferred for *Banach*'s catalyst systems.

Selection of a catalyst system like that in *Banach* was not known to be a result effective variable capable of suppressing DEG formation in polyester resins that incorporate a difunctional sulfonomer modifier. Nothing in the scope and content of the prior art suggests the use of  $\text{Na}_2\text{HPO}_4$  for such a purpose. Indeed, in the context of the claimed invention, it was surprisingly discovered that  $\text{Na}_2\text{HPO}_4$  is capable of suppressing DEG formation in such a reaction system, while  $\text{NaH}_2\text{PO}_4$  should be restricted to amounts of less than 9 ppm to provide the claimed polyester resin materials having an NSR of less than 10. See by way of non-limiting example, Applicants' specification at p. 9, lines 12-19 and p. 14, lines 5-7, p. 21, lines 1-8; p.22, lines 19-27. In view of the lack of guidance or recognition found in the scope and content of the prior art that the presence of  $\text{Na}_2\text{HPO}_4$  was a result effective variable for suppressing DEG

formation, a person of ordinary skill in the art could not predict or have any reasonable expectation of success that making the Examiner's proposed modifications would arrive at the polyester resins claimed, which have an NSR of less than 10 and an IV of 0.6 to 1.0.

Neither the *Shelby* nor *Sprayberry* references account for these deficiencies in *Fagerburg* and *Banach*. Nothing in *Sprayberry* or *Shelby* provides any suggestion that  $\text{Na}_2\text{HPO}_4$  and  $\text{NaH}_2\text{PO}_4$  have any effect on DEG formation in sulfomonomer modified polyester resin systems and thus NSR of such resins. Likewise, *Abe*, *Amano*, *Schmidt*, *Po*, the *PPT* reference, and *Feddersen*, whether considered independently or as combined, fail to account for the deficiencies of *Fagerburg*, *Banach*, *Shelby*, and *Sprayberry*. None of these references suggests the ability to form rigid containers or parisons with a sulfomonomer modified polyester resin system having suppressed DEG formation and an NSR of less than 10 like those claimed, which include  $\text{Na}_2\text{HPO}_4$ , but have less than about 9 ppm of  $\text{NaH}_2\text{PO}_4$ .

Notably, the PTO has already confirmed the patentability of the claimed polyester resins by issuing U.S. Patent No. 7,473,755, which is related to the inventive technology, but claims the polyester resin itself. Indeed, the present claims stand rejected for non-statutory obviousness-type double patenting over U.S. Patent No. 7,473,755, as addressed below.

For all of these reasons, Applicants respectfully submit that a *prima facie* case of obviousness has not been established in view of the cited references, whether considered singly or in combination; thus, favorable reconsideration and allowance of Claims 1-18 is requested.



### NON-STATUTORY OBVIOUSNESS-TYPE DOUBLE PATENTING

Claims 1-9 and 17 stand rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 7,473,755 in view of Shelby et al. (U.S. Pub. No. 2002/0166833) and Sprayberry et al. (WO 98/48994). This rejection is respectfully traversed.

Notwithstanding, Applicants note the attachment of a timely filed Terminal Disclaimer in compliance with 37 C.F.R. §1.321(d), which overcomes each of the instant rejection. The activities leading to the present application and claims fell within the scope of a joint research agreement, thus U.S. Pat. No. 7,473,755 and the present application are treated as commonly owned via the CREATE ACT (35 U.S.C. §103(c)(2)). Applicants' Terminal Disclaimer simply serves the statutory function of removing the rejections of double patenting and raises neither a presumption nor an estoppel as to the merits of the Examiner's rejection. Applicants' Terminal Disclaimer should **not** be considered as an admission, acquiescence or estoppel as to the merits of the rejection and doing so would be improper. *Ortho Pharmaceutical Corp. v. Smith*, 22 U.S.P.Q.2d 1119, 1124 (Fed. Cir. 1992); *Quad Envtl. Tech. Corp. v. Union Sanitary Dist.*, 20 U.S.P.Q.2d 1392 (Fed. Cir. 1991). Consequently, Applicants respectfully request that these rejections be reconsidered and withdrawn.

## CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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